SUPPORTING INFORMATION

Electrochemistry of the [4Fe4S] cluster in base excision repair proteins: Tuning the redox potential with DNA

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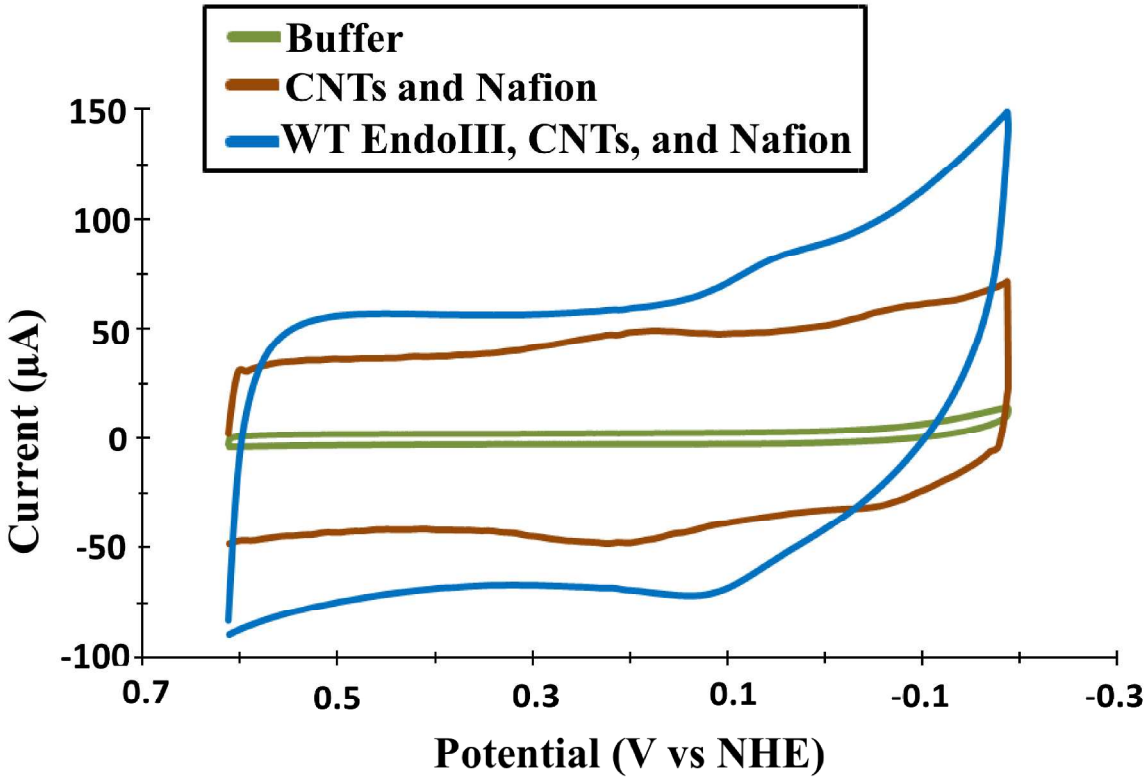

Figure S1. CV scans of storage buffer, a CNT/Nafion thin film, and a WT EndoIII/CNT/Nafion thin film. CNTs increase the capacitance dramatically relative to buffer alone (20 mM sodium phosphate, pH 7.5, 150 mM NaCl, 0.5 mM EDTA; green plot), although they also enhanced the signal due to charged surface species (around 200 mV vs NHE) in addition to a signal near -80 mV vs NHE attributable to oxides on the CNTs themselves (brown plot). Notably, neither of these peaks exhibited any splitting, indicative of rapid processes taking place at the surface. Incorporation of 75 µM EndoIII into the thin film suppressed both of these signals, and resulted in the appearance of a reversible signal with noticeable peak splitting near 100 mV vs NHE. The much higher capacitance in these CVs relative to those in Figure 1 is due to the addition of 3-6 more layers of CNT/protein than later CVs, which made the comparison easier but also caused the EndoIII peaks to be less clearly defined. All CVs were taken at a scan rate of 100 mV/s.

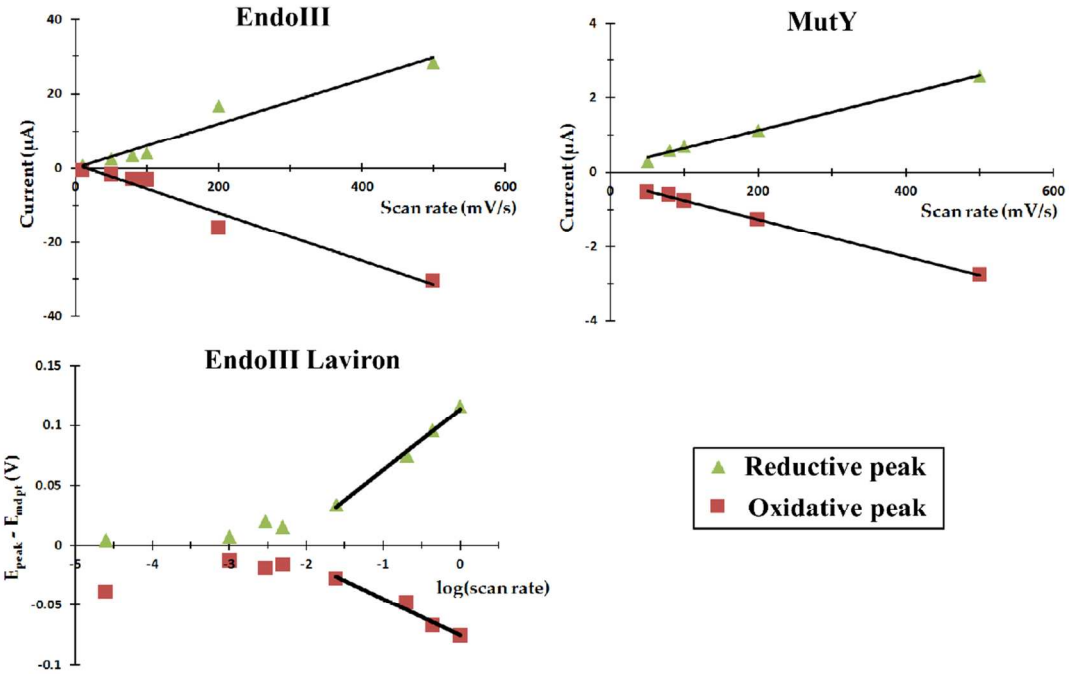

Figure S2. Scan rate dependence of the current for EndoIII and MutY, and peak splitting for WT EndoIII. The linear dependence of current on scan rate confirms that the protein is adsorbed to the electrode surface (EndoIII, top right; MutY, top left). Because the proteins were adsorbed to the surface, Laviron's method for non-diffusive systems was applied to estimate electron transfer rates (k_{ET}) and coefficients (α) for EndoIII (bottom; the small size of the MutY signal precluded Laviron analysis).

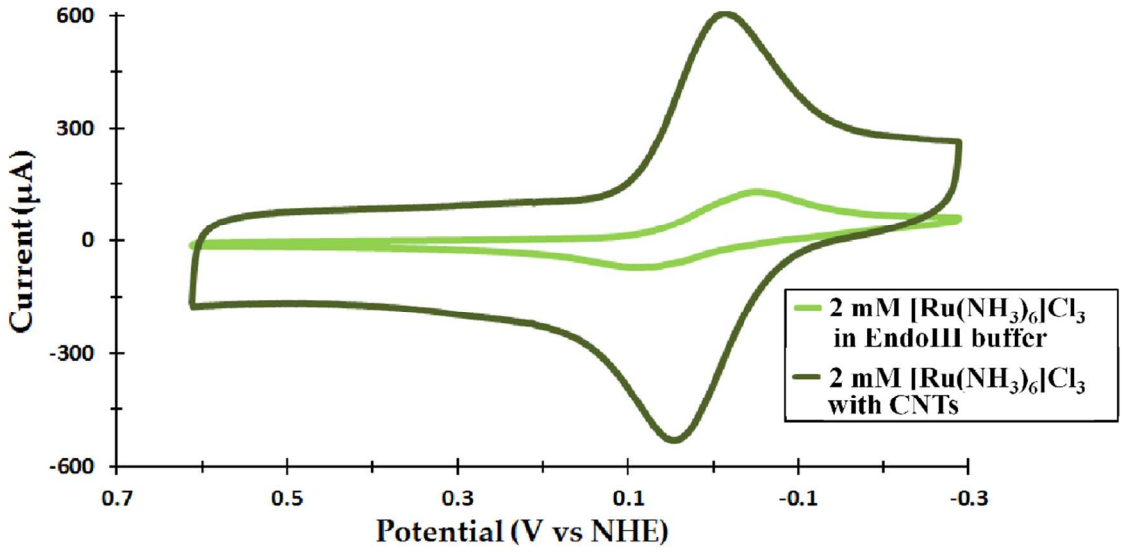

Figure S3. Electrochemistry controls on the PGE electrode. To determine the electroactive area of the PGE electrode and to verify the accuracy of measured potentials, 2 mM $[Ru(NH_3)_6]^{3+}$ in EndoIII storage buffer was added in the presence (dark green) and absence of CNTs (light green). Notably, while the peak splitting decreased slightly in the presence of CNTs, the midpoint potential was unaltered.